WHAT IS CLAIMED IS:

1. A multi-channeled loop heat transfer device designed to transport heat through phase change of working fluid within one loop, comprising:

an evaporating section and a condensing section, each of said evaporating and condensing sections consisting of a plurality of fluid supply flattened tubes, with a plurality of oblique louver fins externally attached to said flattened tubes and individually having a plurality of strips cut at an angle of attack relative to a main gas flow, each of said flattened tubes having a multi-channeled fluid path therein for accomplishing both capillary pumping effect and vapor feeding effect with a wick structure being set within the multi-channeled fluid path, said flattened tubes being parallely arranged between upper and lower fluid supply headers while being inserted into and held by the headers at opposite ends thereof; and

a vapor pipe and a liquid pipe individually extending between said evaporating and condensing sections, thus forming a closed circuit for heat transfer working fluid,

whereby said device forms active vortices and breaks boundary layer growth on the fin outside of the flattened tubes, thus having an improved heat transfer rate.

2. The multi-channeled loop heat transfer device according to claim 1, wherein the flattened tubes of said evaporating section are parallely arranged between said upper and lower headers while being fitted into a plurality of fitting slits of said headers, with two support frames extending at top and bottom ends of said

flattened tubes while supporting the flattened tubes and blocking opposite ends of each of said headers, while a fluid pumping wick of the wick structure set within the evaporating section is always immersed in liquid within said lower header at its lower portion, thus pumping up the liquid through the capillary pumping effect formed by its capillary holes, with an end cap made of a porous material and set within a lower portion of said evaporating section so as to prevent a backflow of vapor and to act as a fluid diode.

3. The multi-channeled loop heat transfer device according to claim 1, wherein said condensing section has a construction similar to that of said evaporating section, but is free from any condensate drainage slot on an external surface of its flattened tubes or on a central portion of said oblique louver fins and has a multi-channeled wall structure within the flattened tubes, and is free from any fluid pumping wick within the channels of the flattened tubes.

4. The multi-channeled loop heat transfer device according to claim 1, wherein the number of fluid pumping wicks of the wick structure set within the channel of the flattened tubes is controlled in accordance with a desired thermal capacity of said headers, thus controlling pressure loss and mass rate of vapor flow within the device as desired.

5. The multi-channeled loop heat transfer device according to claim 1, wherein said vapor pipe has an outer diameter smaller than that of a heat pipe having the same heat transfer capacity

and is thermally insulated.

6. The multi-channeled loop heat transfer device according to claim 1, wherein said liquid pipe is able to be subcooled so as to prevent an undesired boiling at an inlet of said evaporating section.

7. The multi-channeled loop heat transfer device according to claim 1, wherein said multi-channeled fluid path within the flattened tubes has a cross-section selected from the group consisting of circular, elliptical, square, rectangular or hexagonal cross-sections.

8. The multi-channeled loop heat transfer device according to claim 1, wherein said multi-channeled fluid path of the flattened tubes is divided by a multi-channel division wall, thus being free from forming a vapor layer at a liquid/vapor interface even in the case of an application of high external thermal load and allowing vapor of the vapor layer to flow into a neighboring wick-free path so as to prevent vapor lock.

9. The multi-channeled loop heat transfer device according to claim 1, wherein the multi-channeled wall of the fluid paths of said evaporating and condensing sections has a surface selected from the group consisting of a micro-grooved surface or a micro-finned surface.

10. The multi-channeled loop heat transfer device according to claim 1, wherein the flattened tubes of said evaporating

section are vertically positioned, with heat being absorbed from outer surfaces of the evaporating section and the capillary pumping wick structure being formed by an H-shaped wick, thus forming a desired capillary pumping force and maintaining a desirable positive temperature gradient in the vapor flowing within the evaporating section, said H-shaped wick being set within the channel of the flattened tubes and having a porous media wick structure.

11. The multi-channeled loop heát transfer device according to claim 1, wherein the flattened tubes of said evaporating section are horizontally positioned, with heat being absorbed from outer surfaces of the evaporating section and the capillary pumping wick structure being formed by an I-shaped wick, thus forming a desired capillary pumping force and maintaining a desirable positive temperature gradient in the vapor flowing within the evaporating section, said I-shaped wick being set within the channel of the flattened tubes and having a porous media wick structure.

12. The multi-channeled loop heat transfer device according to claim 1, wherein said wick structure is formed by an axially braided micro wire twisted in an axial direction outside a spring which support the said wick in a radial direction.

13. The multi-channeled loop heat transfer device according to claim 1, wherein said wick structure is formed by a mesh wick formed by a plurality of micro-wire woven screen meshes set within the channel of the flattened tubes to form a multi-layered wick

structure.

14. The multi-channeled loop heat transfer device according to claim 1, wherein said wick structure is designed to prevent a vapor backflow at a liquid/vapor interface, formed in the lower portion of the flattened tubes of said evaporating section, even in the case of an application of high external thermal load, thus performing a fluid diode function within a heat transport loop.

15. The multi-channeled loop heat transfer device according to claim 1, wherein said liquid pipe has a serpentine structure capable of subcooling the working fluid using external condensed water formed by a cooling and dehumidifying process of either an evaporator of an air conditioner or a cold storage box with ice cubes or encapsulated phase changing material balls of a cool air generator.

16. The multi-channeled loop heat transfer device according to claim 1, wherein said vapor pipe has an outer diameter larger than that of said liquid pipe and is always maintained at a temperature higher than that of the liquid pipe, thus allowing the gas phase working fluid to always flow into the liquid pipe due to vapor pressure within the vapor pipe, with backflow prevention means being provided within the device for automatically restarting the device without allowing a backflow of fluid when thermal load acts on the device after a complete stop of the device.

17. The multi-channeled loop heat transfer device according

to claim 1, wherein said vapor pipe has a evaporating section and condensing section with the OLF fin , being the side oblique angle γ of the above oblique louver fin is set to $-60° \leq \gamma \leq 60°$, while the angle of attack β of the louver fin is set to $-90° \leq \beta \leq 90°$.